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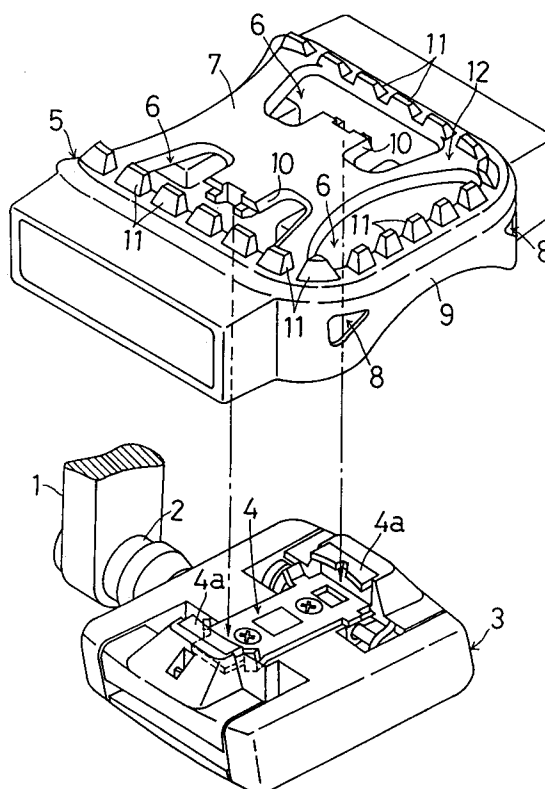
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(54) **Bicycle pedal system having variable tread surfaces.**

(57) A bicycle pedal system with adaptable pedal thread surfaces includes a pedal (3) having a first tread surface (4) and an adapter (5) attachable to the first tread surface. The adapter defines a second tread surface (7) opposite to a surface thereof facing the first tread surface when the adapter is attached to the first tread surface. The first and second tread surfaces provide different use modes. The first tread surface (4) includes a cleat engaging device (4a) for engaging a cleat, and the second tread surface (7) defines an antislip device (16) suited to treading by a shoe. In an alternative pedal system, the first tread surface (14) defines an antislip device (16) suited to treading by a shoe, and the second tread surface (19) includes a cleat engaging device (20, 21).

FIG.1**EP 0 516 013 A2**

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a bicycle pedal system having tread surfaces adaptable to cleat shoes and ordinary shoes.

DESCRIPTION OF THE RELATED ART

Conventionally, when the cyclist wears shoes with cleats attached thereto for pedaling a bicycle, pedals having tread surfaces with cleat engaging devices are attached to the crankset. When the cyclist wears ordinary shoes without cleats for pedaling the bicycle, pedals having antislip devices instead of the cleat engaging devices are attached to the crankset since ordinary shoes tend to slip on the pedals for engaging cleats.

Thus, depending on the types of shoes worn by the cyclist, the different types of pedals are selectively used.

Where the above two types of shoes are selectively worn, it is necessary to have the two types of pedals available and to attach an appropriate type of pedals to the crankset. This forces a waste of time and money on the cyclist.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a novel pedal system for allowing the cyclist to use cleat shoes and ordinary shoes selectively without wasting time and money.

The above object is fulfilled, according to the present invention, by a bicycle pedal system with adaptable pedal tread surfaces comprising a pedal having a first tread surface, and an adapter attachable to the first tread surface, the adapter defining a second tread surface opposite to a surface thereof facing the first tread surface when the adapter is attached to the first tread surface, the first and second tread surfaces providing different use modes.

The first tread surface may include a cleat engaging device for engaging a cleat, while the second tread surface may define an antislip device suited to treading by a shoe. Conversely, the first tread surface may define an antislip device suited to treading by a shoe, while the second tread surface may include a cleat engaging device.

As noted above, an adapter for ordinary shoes is provided for the cleat shoe pedal. Conversely, an adapter for cleat shoes is provided for the ordinary shoe pedal. This simple provision allows the cyclist to select the tread surface formed on the pedal or the tread surface formed on the adapter according to the type of shoes the cyclist wears. Thus, tread

surfaces suited to the different types of shoes are made available to the cyclist. When the cyclist wears cleat shoes, he or she may pedal the bicycle with the shoes fixed to the pedals by means of the cleat engaging devices provided as integral part of the pedals or formed on the pedals by using the adapters. When the cyclist wears ordinary shoes, he or she may pedal the bicycle with the shoes placed on the pedals and prevented from slipping thereon by the antislip devices provided as integral part of the pedals or formed on the pedals by using the adapters. In the latter instance, the cyclist can freely remove his or her feet from the pedal when necessary.

The present invention provides one type of pedal, i.e. the cleat shoe pedal or ordinary shoe pedal, and one adapter for this pedal. Whichever of the cleat shoe or ordinary shoe is selected, the cyclist can obtain a tread surface suited to the shoe. This is more economical than where the two types of pedals are provided.

Moreover, the adapter may be detachably secured to the pedal through a simple mounting structure compared with the case of interchanging pedals. The pedal specification may be altered relatively easily to accommodate change of shoes used.

Other features and advantages of the present invention will be apparent from the description of the preferred embodiments to be had with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view showing a relationship between a pedal for a cleat shoe used in a pedal system according to the present invention and an adapter attachable to the pedal,

Fig. 2 is a sectional view of the adapter mounted on the pedal shown in Fig. 1,

Fig. 3 is a perspective view showing a relationship between a pedal for an ordinary shoe used in the pedal system according to the present invention and an adapter attachable to this pedal, and

Fig. 4 is a sectional view of the adapter shown in Fig. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 shows a pedal for a cleat shoe used in a pedal system according to the present invention and an adapter attachable to the pedal. As shown, a bicycle crank arm 1 rotatably supports a pedal body 3 through a pedal shaft 2. The pedal body 3 has opposite tread surfaces. Each tread surface includes a cleat coupling device 4 having a pair of

cleat engaging metal hooks 4a disposed in a forward region and a rearward region thereof. Each of the two hooks 4a is pivotable between a lock position and a release position and biased to the lock position by a lock spring (not shown). This construction allows the cyclist to ride the bicycle with each shoe fixed to the pedal through a cleat. As is well known, the shoe is fixed to the pedal by depressing the cleat, and released from the pedal by displacing the cleat relative to the pedal.

As shown in Figs. 1 and 2, the cleat engaging hooks 4a may be used as an adapter coupling device for detachably securing an adapter 5 to the tread surface of the pedal. This adapter 5 includes a tread surface suited to an ordinary shoe as described later. With the adapter 5 mounted in position, the pedal is converted to a pedal suitable to an ordinary shoe without a cleat and capable of preventing slips of the shoe.

As shown in Fig. 1, the adapter 5 has a main adapter body formed of plastics and including an upper plate portion 7 defining a plurality of perforations 6, and a skirt portion 9 defining a plurality of perforations 8. The upper plate portion 7 includes a pair of couplings 10 formed centrally thereof for connection to the cleat engaging hooks 4a, and a multiplicity of projections 11 arranged peripherally of the upper plate portion 7.

As shown in Fig. 2, the adapter body is formed as a case for covering one of the tread surfaces of the pedal body 3. When the adapter body is placed on the pedal body 3, the couplings 10 in their approach to the cleat engaging hooks 4a cause the hooks 4a to pivot in releasing directions. Subsequently, the lock springs (not shown) cause the hooks 4a to return to the lock positions for engaging the couplings 10, respectively. The entire adapter is thereby secured to the pedal body 3 not to be readily releasable. With the skirt portion 9 surrounding and contacting sides of the pedal body 3, the adapter 5 is not movable relative to the pedal body 3 along the tread surface. Once the adapter 5 is mounted on the pedal, an outer surface 12 of the upper plate portion 7 acts as a shoe receiving tread surface lying above the cleat coupling device 4 on the tread surface of the pedal on which the adapter 5 is mounted. In this state, the projections 11 of the outer surface 12 act as an antislip device.

The entire adapter 5 is releasable from the pedal by disengaging the couplings 10 of the adapter body from the cleat engaging hooks 4a through movement similar to the well known operation to release the cleat from the pedal.

Fig. 3 shows a pedal for an ordinary shoe used in a pedal system according to the present invention and an adapter attachable to this pedal. As shown, a bicycle crank arm 1 rotatably supports a

pedal body 13 through a pedal shaft 2. The pedal body 3 has opposite tread surfaces 14. Each tread surface 14 includes an antislip ridge 15 and antislip projections 16 defined on a pedal frame. This construction allows the cyclist to pedal the bicycle with each ordinary shoe without a cleat placed on the tread surface 14 free from slips.

As shown in Fig. 4, the pedal body 13 has a shaft connecting portion 13a available for use as an adapter mount for detachably securing an adapter 17 to the pedal body 13. The adapter 17 defines cleat receiving tread surfaces as described later. With the adapter 17 mounted in position, the pedal is converted to a pedal suitable for securing a shoe with a cleat.

As shown in Fig. 3, the adapter 17 has main adapter bodies 19 formed of sheet metal and each including a pair of couplings 18. Each adapter body 19 further includes a fixed engaging claw 20 and a movable engaging claw 21. The claw 21 is pivotable about an axis X between a lock position and a release position and biased to the lock position by a spring 22.

As shown in Fig. 4, the couplings 18 of the adapter body 19 placed on one tread surface 14 of the pedal body 13 are rigidly connected by mounting screws 23 to the couplings 18 of the adapter body 19 placed on the other tread surface 14. Thus, the couplings 18 of the two adapter bodies 19 immovably fix the adapter 17 to the pedal body 13, with the shaft connecting portion 13a of the pedal body 13 sandwiched in between.

Once the adapter 17 is mounted on the pedal, each pair of fixed cleat engaging claw 20 and movable cleat engaging claw 21 are opposed to one another across the tread surface 14.

The adapter 17 is detachable from the pedal by removing the mounting screws 23 to disconnect the adapter bodies 19.

In each of the foregoing embodiments, the cleat coupling device or the shaft connecting portion is used also as an adapter mount for allowing attachment of the adapter to the pedal body. This attaching structure or connecting mode is of course variable. For example, the adapter may be screwed to a mounting seat.

Claims

1. A bicycle pedal system having adaptable pedal thread surfaces, characterized by
 - a pedal having a first tread surface; and
 - an adapter attachable to said first tread surface, said adapter defining a second tread surface opposite to a surface thereof facing said first tread surface when said adapter is attached to said first tread surface, said first tread surface and said second tread surface

providing different use modes.

2. A pedal system as claimed in claim 1, characterized in that said first tread surface includes a cleat engaging device for engaging a cleat, and said second tread surface defines an antislip device suited to treading by a shoe. 5
3. A pedal system as claimed in claim 2, characterized in that said adapter includes couplings for connection to said cleat engaging device, said second tread surface being defined by tip ends of a plurality of upstanding projections, said cleat engaging device being disposed between said first tread surface and said second tread surface when said adapter is mounted on said pedal. 10 15
4. A pedal system as claimed in claim 3, characterized in that said adapter is formed as a cover for substantially overlying said first tread surface. 20
5. A pedal system as claimed in claim 1, characterized in that said first tread surface defines an antislip device suited to treading by a shoe, and said second tread surface includes a cleat engaging device for engaging a cleat. 25
6. A pedal system as claimed in claim 5, characterized in that said adapter includes a plate member having an attaching surface for contacting said first tread surface, said cleat engaging device being supported by said plate member. 30 35
7. A pedal system as claimed in claim 6, characterized in that said adapter is formed of a pair of adapter bodies attachable to opposite surfaces of said pedal, said adapter bodies being tightened to each other for fixedly mounting on said pedal. 40
8. A pedal for use in a bicycle pedal system having an adapter for converting thread surfaces, characterized by: 45
 - a pedal tread surface for providing a different use mode to an adapter tread surface formed on said adapter; and
 - an adapter mount; 50
 - wherein said pedal tread surface is substantially covered by said adapter attached to said adapter mount.
9. A pedal as claimed in claim 8, characterized in that said pedal tread surface includes a cleat engaging device for engaging a cleat. 55
10. A pedal as claimed in claim 8, characterized in that said pedal tread surface defines an antislip device suited to treading by a shoe.
11. An adapter for a bicycle pedal system having thread surfaces convertible by the adapter mounted on a pedal, characterized by:
 - an adapter tread surface formed on an upper portion of said adapter for providing a different use mode to a pedal tread surface formed on said pedal; and
 - connecting means for connecting said adapter to said pedal;
 - characterized in that said adapter substantially covers said pedal tread surface when said adapter is attached to said pedal through said connecting means.
12. An adapter as claimed in claim 11, characterized in that said adapter tread surface includes a cleat engaging device for engaging a cleat.
13. An adapter as claimed in claim 11, characterized in that said adapter tread surface defines an antislip device suited to treading by a shoe.

FIG.1

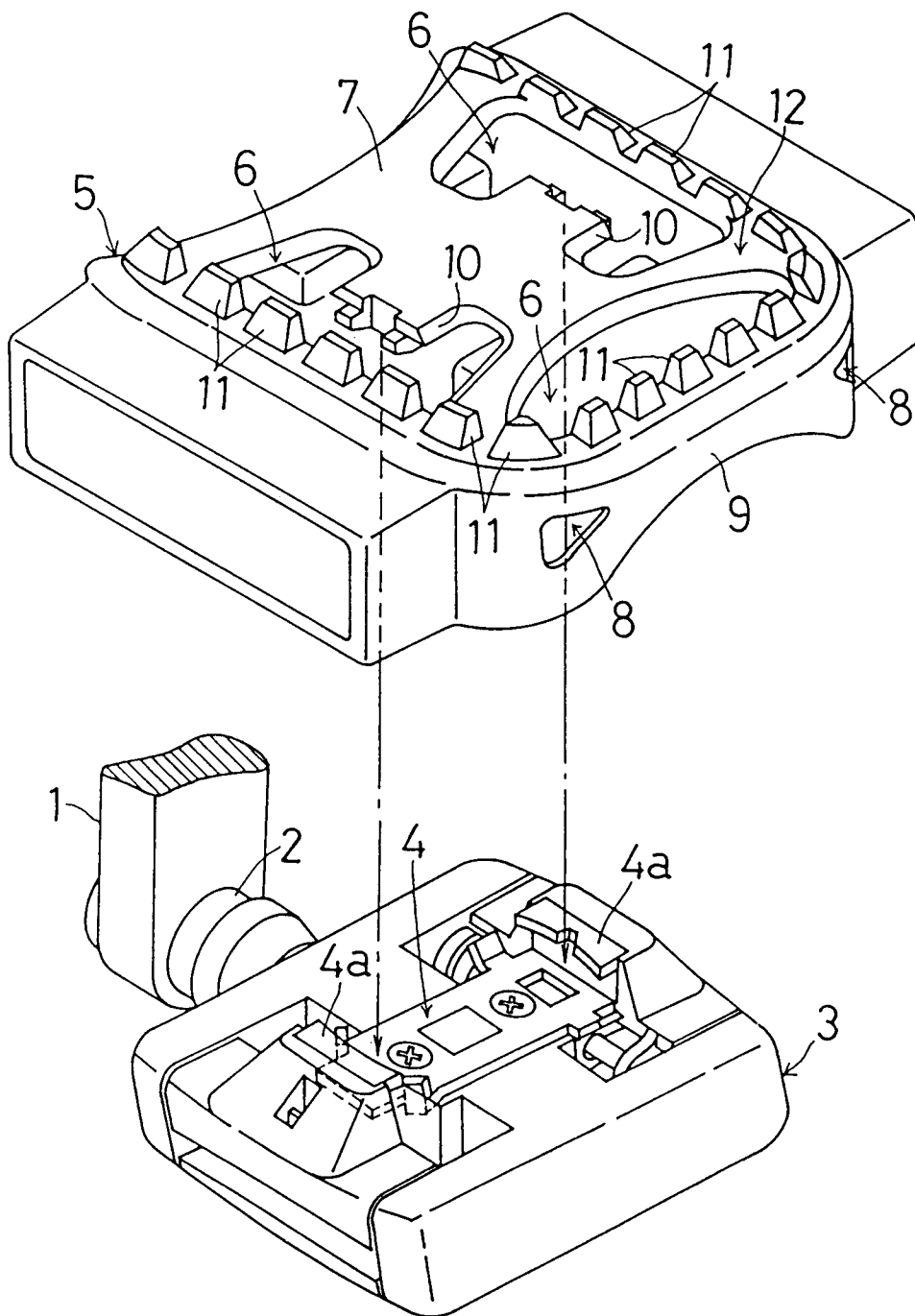


FIG.2

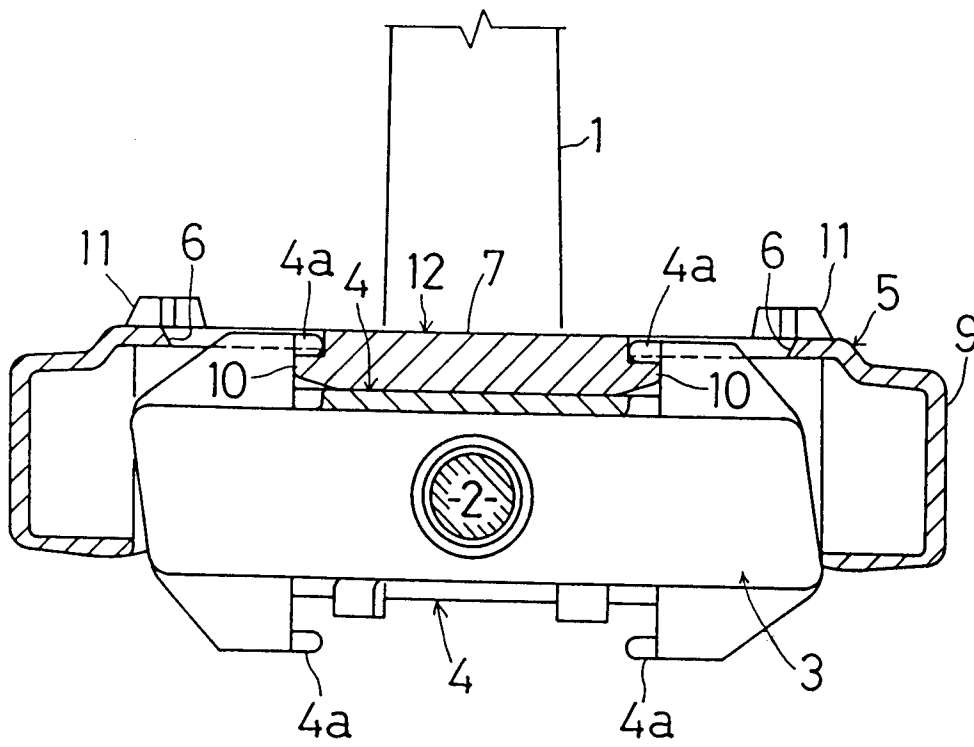


FIG.3

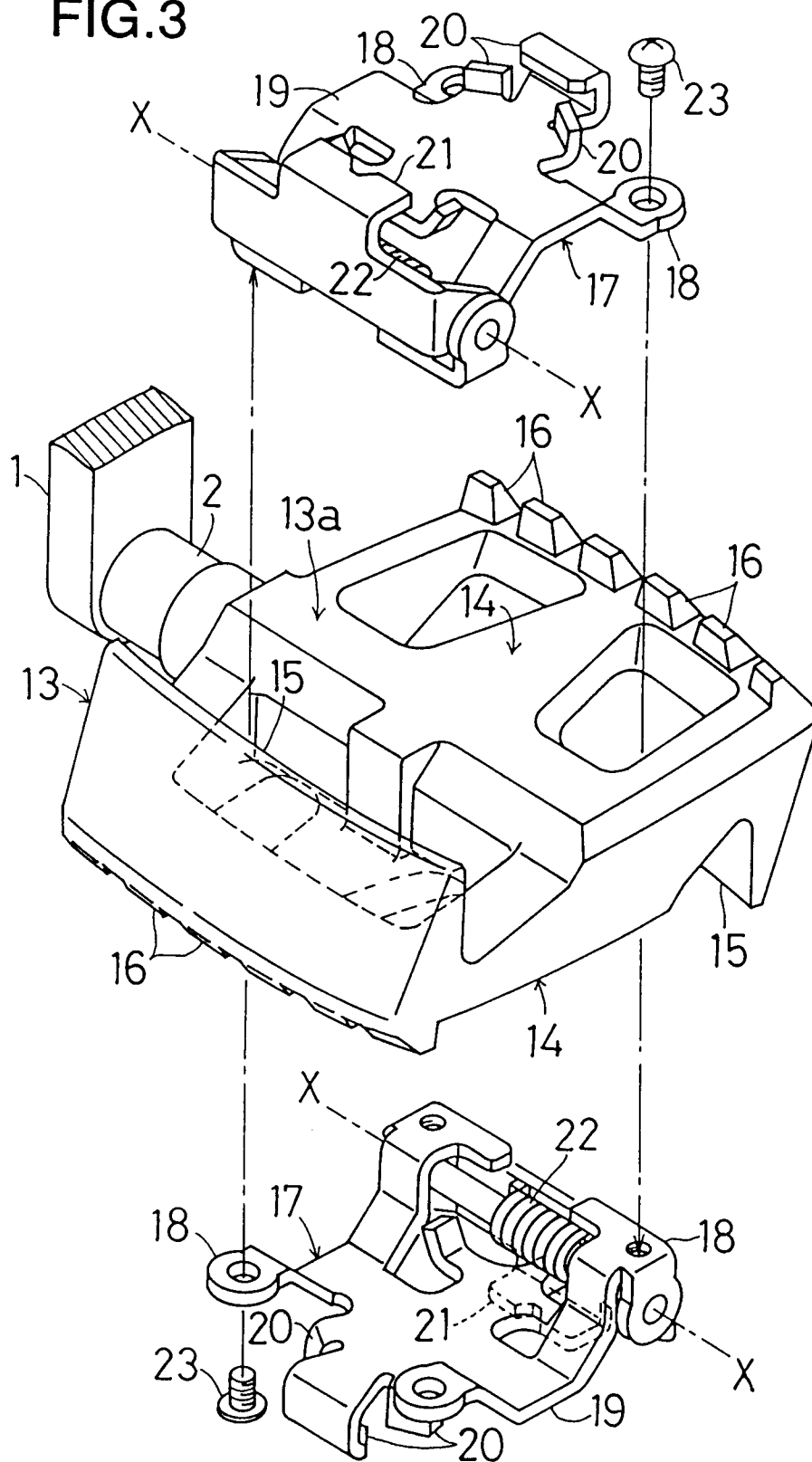


FIG.4

